

Claims

1. Electric locking device for locking brake, clutch, or accelerator pedal of an automobile comprising:

an encoder 5, a decoder 6, a control circuit 7 for controlling the operation of the motor and controlling the operation of the theft prevention systems working together with the locking device, driver circuit 8 for amplifying and formatting signals into a suitable form to control motor operations, motor 9 which functions as a power source in moving the mechanism for locking brake, clutch, and/or accelerator pedal 10 to carry a locking member 29 into locking or unlocking condition with the brake, clutch, and/or accelerator pedal to prevent these parts from functioning normally; the said mechanism being assembled to a rotation axle of the motor and then encased in a metal cylinder 28 to protect the mechanism and internal device from damage, a master lock for unlocking in case the electrical circuit or motor fails to operate.

Characterized in that the decoder 6, control circuit 7, driver circuit 8 including connections between these circuits to the motor are encased to protect from damages or changes of connections of the circuits, these parts operating together in such a manner that when the decoder 6 receives an instruction signal

to lock or unlock from the device or encoder 5, it will compare the code signal with a predetermined code for a matching and if the code signal matches the predetermined code, then a signal will be sent to the control circuit 7 to make the control circuit send an output 11 to control the operations of the theft prevention systems working together with the locking device and send a control signal 40 to a driver circuit to amplify and format signals into a suitable form to drive the motor 9 in order to rotate the locking mechanism 10 to carry a locking member 29 to move to lock the brake, clutch, and/or accelerator pedal of a vehicle so they cannot be used or moved to unlock the brake, clutch, and/or accelerator pedal of a car so they cannot be used; the control circuit also monitors the distance and position of the travel of the locking mechanism or the rotation position of the motor to determine whether it is in locking or unlocking conditions by comparing the electrical current used in driving the motor and/or counting the revolutions of the motor and/or receiving a signal from a sensor when the sensor detect the locking or unlocking position of the mechanism;

when any part of the electrical circuit or motor fails to function, a key can be used to unlock the master lock to disengage the locking mechanism and the encoder 1 can be used to send a signal to reset to the decoder 2 provided separately in order to make the decoder compare the code signal received with a

predetermined code and send a signal to disable the theft prevention systems 3 for matching in order to send an output 4 to reset the theft prevention systems working together with the locking device.

2. An electric locking device for locking brake, clutch, and/or accelerator pedal of an automobile according to Claim 1 capable of using a micro controller or integrated circuit specially designed to compare code signal received from the encoder 5 with a predetermined code for a matching; if a matching is detected, the micro controller or integrated circuit will carry out a processing to send an output to control the operation of the theft prevention systems working together with the locking device and send a control signal to drive the motor to rotate and move the locking mechanism to carry the locking member 29 to move to lock the brake, clutch, and/or accelerator pedal instead of using the decoder 6, control circuit 7, and driver circuit 8.
3. An electric locking device for locking brake, clutch, and/or accelerator pedal of an automobile according to Claim 1, wherein the transmission of the code signal to instruct the locking or unlocking from the encoder 5 to the decoder 6 is a wired or wireless transmission of signal.
4. An electric locking device for locking brake, clutch, and/or accelerator pedal of an automobile according to Claim 1, wherein the transmission of code signal for

resetting from the encoder 1 to a separate set of decoder 2 is a wired or wireless transmission of signals.

5. An electric locking device for locking brake, clutch, and/or accelerator pedal of an automobile according to Claim 1, wherein the electric locking device is permanently attached inside an automobile by attaching to the cylindrical casing of the steering wheel axle, or in the proximity of the cylindrical casing of the steering wheel, or at the attachment base of the brake pedal or the automobile body.
6. An electric locking device for locking brake, clutch, and/or accelerator pedal of an automobile according to Claim 1, wherein the locking mechanism for locking brake, clutch, and/or accelerator pedal of an automobile 10 comprises at least:

A set of master lock including a key 12 specifically designed for each individual locking device for unlocking the master lock 14 in case any part of the electrical circuit used for locking or unlocking (decoder 6, control circuit 7, driver circuit 8) or motor 9 fails to function, the master lock having an axle 14a protruding to engage with the groove 15a of a cam set 15 for assisting in the unlocking operation, the body of the master lock 14 being inserted into the hole 13a of the master lock base 13 and the body of the cam set 15 being inserted into a hole 16a

of the rack base 16 to support and prevent vibration and misalignment while using the key to unlock the master lock;

a gear set comprising a worm gear 22 having an axle 22a and 22b projecting from both sides, the axle 22a being mounted to the rotation axle 9a of the motor 9 and the axle 22b being mounted to the hole of the rack base 16, a spur gear 20 having at least 1 pawl 20a projecting out for engaging with a groove 17a of the spiral gear 17, a rack 26 connected to a moving axle 35 having one end of the moving axle connected to the locking member 29 and spring 19 wherein all the parts are assembled to work in coordination such that the spiral gear 17, spur gear 20 are mounted to the axle 21 using a pawl 20a of the spur gear to engage in the groove 17a of the spiral gear 17 then bringing the spring 19 to engage with the axle to retain the spur gear and the spiral gear from separating from each other while the motor rotates to move the locking mechanism to carry the locking member 29 into and out of locking condition.

7. An electric locking device for locking brake, clutch, and/or accelerator pedal of an automobile according to Claim 1, wherein the mechanism for locking brake, clutch, and/or accelerator pedal 10 comprises at least:

a master lock 14 and a lead screw 51 with a hole on one end for insertion of the rotation axle 9a of the motor 9, the lead screw being supported to prevent

vibration and misalignment with a bush 52 and the body of the lead screw being inserted into a female screw hole 50 of the moving axle 35 which is connected to the locking member 29.

a metal cylinder 28 attached to an attachment leg 27 provided for installing the locking device permanently inside an automobile, one end 27d of the attachment leg 27 being curved to fit the shape of the cylindrical casing of the steering wheel axle and also curved to receive the end 42d of the attachment member 42 which is curved to conform with the shape of the cylindrical casing of the steering wheel axle; both parts being installed to the cylindrical casing of the steering wheel before inserting a screw 43 through the hole 42a and hole 42b of the attachment member 42 and the hole 27a and hole 27b of the attachment leg 27 then tightening the screw and bringing a screw cover plate 44 to assemble with the attachment 42 with the hole 44a of the screw cover plate aligned to the hole 42c of the attachment member 42 to make the screw cover plate cover both screws 43 so they cannot be unscrewed, then bringing the locking shaft 14b of the master lock 14 to insert into the holes 44a, 42c and 27c respectively to lock the master lock.

8. An electric locking device for locking brake, clutch, and/or accelerator pedal of an automobile according to Claim 7, wherein the end 27d of the attachment leg 27 is

bent to conform with the attachment base of the accelerator pedal and to receive the end 42d of the attachment member 42 which is also bent to conform with the attachment base of the accelerator pedal.

9. An electric locking device for locking brake, clutch, and/or accelerator pedal of an automobile according to Claim 1, wherein the locking mechanism 10 comprises at least:

a cam rotation disc set 63 having a hole for inserting the rotation axle 9a of the motor 9 with the body of the cam rotation disc set having an axle 62 projecting out for coupling with a swing axle 61 as shown, the swing axle having one end provided with a hole to insert a latch 60 for attachment to the moving axle 35 in the area of the groove 35a.

10. An electric locking device for locking brake, clutch, and/or accelerator pedal of an automobile according to Claim 1, wherein the locking mechanism 10 comprises at least:

a sprocket 65 mounted to the rotation axle 9a of the motor 9 attached to a motor attachment plate 24, a chain 67 for engaging with the sprocket 65, and a sprocket 66 having at least one groove for engaging with a pawl 20a of the spur gear 20 mounted to the axle 21, the sprocket 66 and spur gear 20 being fixed together while the motor 9 is rotating by the spring 19, a rack 26 connected to

the moving axle 35 and having one end of the moving axle connected to the locking member 29.

11. An electric locking device for locking brake, clutch, and/or accelerator pedal of an automobile according to Claim 1, wherein the locking mechanism 10 comprises at least:

a connector 72 having a hole 72a for inserting the rotation axle 9a of the motor 9 and having at least one pawl 72b for engaging with the groove 71a of a pulley 71; the connector 72 and the pulley 71 (pulley 71 mounted to the axle 21) being assembled before using a spring 19 to engage with an axle to retain the pulley from moving away from the connector 72; the pulley 71 and pulley 74 being mounted with a belt to assist in driving pulley 74 and the cam rotation disc set 63 mounted to the axle 78 to rotate and force the swing axle 61 to pull or push the moving axle 35 to carry the locking member 29 into or out of locking condition.

12. An electric device for locking brake, clutch, and/or accelerator pedal of an automobile according to Claim 1, wherein the electrical circuit for controlling the locking and unlocking operation of the motor can be applied to control the operation of the locking mechanism driven by a motor in order to force the locking mechanism to move and carry the moving axle 35 and the locking member 29 to lock the brake, clutch, and/or accelerator pedal of an automobile out of operation .